Remarks

Claims 25-70 are pending in the instant application. Applicants have canceled claims 1, 13, 17-21, and 23-24 without prejudice or disclaimer. Applicants reserve the right to pursue the canceled subject matter in one or more continuing applications. Applicants have also amended claims 37, 44, 51-52, 56-57, 61-62, and 66-67. Support for the amended claims 37 and 44 can be found in Table 1E, page 457, 4th column of the specification as filed. No new matter has been added.

I. Rejection of Claims Under 35 U.S.C. § 112, First Paragraph

Written Description of Claims 37-70

Claims 37-70 have been rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, the Examiner alleges:

> Claims 37-70 are directed to isolated proteins which are at least 90-95% identical to SEQ ID NO:164, at least 90-95% identical to amino acid residues 27 to 111 of SEQ ID NO:164, at least 90-95% identical to the secreted portion (or complete polypeptide) of the polypeptide encoded by the HHTLF25 cDNA contained in ATCC Deposit No. 209125, and contiguous amino acid residues of SEQ ID NO:164. Claims reciting 90% and 95% sequence identity are inclusive of sequences from other species, mutated sequences, and allelic variants having different functional activities than that of the protein in SEQ ID NO:164. Claims drawn to proteins 'consisting of at least' (i.e., comprising) any 30 or 50 contiguous amino acid residues of SEQ ID NO:164, includes a large genus of proteins having unique functional activities, whereas applicants only disclose one member of the genus (i.e., SEQ ID NO:164) and haven't disclosed any other proteins having portions of SEQ ID NO:164. In addition, proteins having any 30 or 50 residues of SEQ ID NO:164 would be expected to have unique functional activities, wherein the specification has not disclosed any proteins having functional activities different from those of SEQ ID NO:164. None of these sequences meet the written description provision of 35 USC 112, first paragraph. The specification provides insufficient written description to support the genus encompassed by the claims.

See Paper No. 9, page 3, line 18 to page 4, line 10.

Applicants point out that claims 37 and 44 have been amended to recite a biological function to encompass species possessing the same functional activity as SEQ ID NO:164.

Since Applicants have disclosed species representative of the entire genus, one of ordinary skill in the art would reasonably conclude that Applicants were in possession of the claimed genus. Furthermore, claims 51-52, 56-57, 61-62, and 66-67 have been amended to delete the phrase "at least," thereby solely using the transitional phrase "consisting of." Applicants assert that these claims, as amended, fully meet the written description requirement since one of ordinary skill in the art can readily envision all species encompassed by the claims.

Indeed, the test for the written description requirement is whether one skilled in the art could reasonably conclude that the inventor has possession of the claimed invention in the specification as filed. *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563, 19 U.S.P.Q.2d 1111, 1116 (Fed. Cir. 1991); M.P.E.P. § 2163.02.

The Federal Circuit recently re-emphasized the well-settled principle of law that "[t]he written description requirement does not require the applicant 'to describe exactly the subject matter claimed, [instead] the description must clearly allow persons of ordinary skill in the art to recognize that [they] invented what is claimed,'" *Union Oil Co. v. Atlantic Richfield Co.*, 208 F.3d 989, 54 U.S.P.Q.2d 1227 (Fed. Cir. 2000), hereinafter referred to as "*Unocal.*" While the applicant must "blaze marks on trees," rather than "simply [provide] the public with a forest of trees," an Applicant is not required to explicitly describe each of the trees in the forest. *See Unocal*, 208 F.3d at 1000. *See also* M.P.E.P. § 2163.02 ("The subject matter of the claim need not be described literally (*i.e.*, using the same terms or *in haec verba*) in order for the disclosure to satisfy the description requirement."). The Court emphasized the importance of what the person of ordinary skill in the art would understand from reading the specification, rather than whether the specific embodiments had been explicitly described or exemplified. As the court noted, "the issue is whether one of skill in the art could derive the claimed ranges from the patent's disclosure." *Unocal*, 208 F.3d at 1001 (emphasis added).

Applicants respectfully disagree with the Examiner and submit that one skilled in the art would reasonably conclude that Applicants had possession of the polypeptides encompassed by the rejected claims in the present application as filed. Applicants further submit that the Examiner has underestimated both the teaching of the present application and the level of skill in the art on the priority date of the present application.

In support of the 35 U.S.C. § 112, first paragraph rejection, the Examiner cited *Fiers v. Revel* and *Amgen, Inc. v. Chugai Pharmaceutical Co. Ltd.* (hereinafter *Fiers* and *Amgen* respectively) which establishes that the nucleic acid sequence itself is required for adequate

written description. In *Fiers*, the sequence of beta-interferon was not disclosed; rather only the method to obtaining its sequence was disclosed. Similarly, in *Amgen*, the sequence of human erythropoietin was never disclosed. The Examiner further cites *Fiddes v. Baird* (hereinafter *Fiddes*) to support the lack of written description rejection. In *Fiddes*, claims to mammalian fibroblast growth factor were found overly broad since only bovine sequence was disclosed. However, in the present application, Applicants have disclosed the sequence of SEQ ID NO:164 along with species representative of the genus. *See*, for example, page 58, line 4 and lines 5-16. Furthermore, unlike in *Fiddes*, Applicants are not claiming all mammalian orthologues of SEQ ID NO:164; rather, Applicants have specifically identified the sequence that embodies the claimed invention.

Lastly, the Examiner has cited *Regents of the University of California v. Eli Lilly & Co.*, (hereinafter *Eli Lilly*). The central issue in *Eli Lilly* involved claims to all mammalian cDNAs encoding insulin, which were supported in the specification only by the nucleotide sequence for the rat insulin gene. The Federal Circuit found the claims to human insulin lacked written description because the claims defined only a result or function. The court held that a result or function will satisfy the written description requirement *only if* correlated to a description of structural features of the claimed invention. According to the court, a sufficient written description must allow the skilled artisan to "visualize or recognize the identity of the members of the genus."

In addition, the court held in *Eli Lilly* that a description of a genus of cDNAs may be achieved by reciting a representative number of cDNAs, defined by nucleotide sequence, falling within the scope of the genus or by reciting structural features common to a substantial portion of the members of the genus. Therefore, it logically follows that claims to polypeptides encoded by cDNAs may also be satisfied by providing sequences of a representative number of polypeptides which fall within the scope of the genus *or* by providing a recitation of structural features common to a substantial portion of the members of the genus.

Applicants assert that, in the instant case, the second test set forth in *Eli Lilly* has been satisfied because Applicants' description of the reference polypeptide sequence, SEQ ID NO:164, provides one skilled in the art with the necessary structural features common to a substantial portion of the members of the genus. Applicants further point out that the recitation of the structural features of the reference protein is a recitation of the structural features common to the members of the claimed genus because the proteins included within

the claimed genus will have at least 90% (or at least 95%) of the amino acids of their amino acid sequence primary structure in common to the reference polypeptide of SEQ ID NO:164. Indeed, nothing more than a basic knowledge of the genetic code and what is described in the specification would be required for the skilled artisan to identify every single one of the polypeptides that are 90% or 95% identical to the amino acid sequence of SEQ ID NO:164 having IL-10 inducing activity. Clearly, such knowledge is well within what is expected of the skilled artisan. Therefore, in accord with *Eli Lilly,* the specification clearly conveys that Applicants were in possession of the claimed invention on the priority date of the instant application.

In view of the arguments above, Applicants submit that the pending claims fully meet the written description requirements of 35 U.S.C. § 112, first paragraph, and respectfully request that the Examiner's rejection of claims 37-70 under 35 U.S.C. § 112, first paragraph, be reconsidered and withdrawn.

II. Claim Rejections Under 35 U.S.C. §§ 101/112

The Examiner has rejected claims 25-70 under 35 U.S.C. § 101 because the claimed invention is allegedly not supported by either a specific or substantial asserted utility or a well-established utility.

Applicants respectfully disagree and traverse.

In order to find that an asserted utility is neither specific nor substantial, the burden is on the Examiner to make a *prima facie* case showing that it is more likely than not that a person of ordinary skill in the art would not consider any utility asserted by the Applicant to be specific or substantial. *See* M.P.E.P. § 2107.02(IV); Utility Examination Guidelines, 66 FR 1092, January 5, 2001 at 1098, col. 3 (emphasis added). In the instant case, the Examiner has provided generalized statements that utilities asserted for the polypeptide SEQ ID NO:164 are not substantial because 1) the utilities asserted by Applicants are general utilities that would be applicable to a broad class of the invention; 2) the utilities asserted by Applicants requires further research to identify a "real world" use; and 3) one of ordinary skill in the art would not appreciate why the invention is useful based on the characteristics of the invention. Thus, while the Examiner has acknowledged that Applicants have asserted utilities in the specification, the utilities are dismissed as being insubstantial or non-specific.

The Examiner alleges that Applicants' asserted utilities are not specific since "the specification does not disclose a specific biological activity for SEQ ID NO:164 and the

specification does not reasonably correlate the activity of SEQ ID NO:164 and a specific disease or condition." *See* Paper No. 9, page 7, lines 4-7. The test for specificity is whether an asserted utility is specific to the subject matter claimed, in contrast to a utility that would be applicable to the broad class of the invention, such as use of a complex machine for landfill. *See*, for example, the Utility Examination Guidelines. The disclosed utilities for SEQ ID NO:164 discussed above are specific, in that not every protein may be used to trigger cellular activation or induce IL-10 production. *See* page 58, lines 2-3 and page 457 of the specification as filed. Consequently, the skilled artisan would most certainly not consider such a use to be a "throw-away utility" such as landfill. Furthermore, where an applicant discloses a biological activity (*e.g.*, cellular activation or induction of IL-10), and reasonably correlates that activity to a disease or condition (*e.g.*, inflammation or other immune disorders), the applicant has sufficiently identified a specific utility for the invention. M.P.E.P. § 2107.01 at 2100-32 (emphasis added). Stated in other words, so long as the correlation between the biological activity and the asserted use in a particular disease or condition is sufficient to convince one of skill in the art, then the specificity requirement of 35 U.S.C. § 101 is satisfied. *See also Fujikawa v. Wattanasin*, 39 U.S.P.Q.2d 1895 (Fed. Cir. 1996).

The Examiner further alleges that the claimed invention is not supported by a substantial or real world utility. In particular, the Examiner claims the alleged utilities would require further research to identify or confirm "real world" use. Preliminarily, the Federal Circuit has found that, "Usefulness in patent law . . . necessarily includes the expectation of further research and development. The stage at which an invention in this field becomes useful is well before it is ready to be administered to humans." *In re Brana*, 51 F.3d 1560, 1568 (Fed. Cir. 1995). Furthermore, Applicants have provided in the specification a reasonable correlation between the biological activity of SEQ ID NO:164 (ability to trigger cellular activation and to induce the production of IL-10) and its asserted utility (involvement in immune disorders and inflammation). The M.P.E.P. states, "any reasonable use that an applicant has identified for the invention that can be viewed as providing a public benefit should be accepted as sufficient, at least with regard to defining a 'substantial' utility. *See* M.P.E.P. § 2107.01(I). Applicants thus assert the claimed invention is supported by a substantial or "real world" utility.

Lastly, the Examiner alleges that the specification is not supported by a well-established utility in that one of ordinary skill in the art would not immediately appreciate why the invention is useful. The Examiner states:

> Applicant must provide evidence that one of ordinary skill in the art would have recognized that the identified specific and substantial utility was well-established at the time of filing. The conclusions made by Lanier, Bakker and Lucas (e.g., overexpression of DAP12 results in severe lymphopenia and inflammation) were not discussed, let alone contemplated in the instant application, and therefore, Applicants may not rely on post-filing date art to provide evidence of a specific and substantial utility.

See Paper No. 9, page 10, line 20 to page 11, line 2 (emphasis in original).

Preliminarily, Applicants note that post-filing date art submitted with Paper No. 7 was used to corroborate a credible utility, not to provide support for a specific or substantial utility as the Examiner alleges. Applicants further point out that one of ordinary skill in the art, at the time of filing, would surely not doubt that "immune function and immune surveillance" (specification at page 59, line 10) would include inflammation. Nonetheless, Applicants point out that inflammation itself was contemplated as a preferred indication as described in Table 1E, page 457. Furthermore, no one would question that lymphopenia, clinically defined as a reduction in the number of lymphocytes, was contemplated by Applicants when immunodeficiencies were disclosed on page 59, line 7. Immunology textbooks define immunodeficiency diseases as group of inherited or acquired disorders in which some aspect or aspects of host defense are absent or functionally defective. *See*, for example, Janeway and Travers, Immunobiology: The Immune System in Health and Disease (1994), submitted herewith as Exhibit A (relevant pages only). Accordingly, Applicants have provided evidence, at the time of filing, wherein a person of ordinary skill in the art would appreciate why the invention was useful.

In addition, Applicants refer the Examiner to the ruling in *Raytheon v. Roper*, 724 F.2d 951 (Fed. Cir. 1983). In this case, the district court found that claims 2-7 of the patent at issue were invalid for lack of utility, and also found that these same claims had been infringed. The Federal Circuit affirmed the holding of infringement, but concluded that the lower court's holding of invalidity due to lack of utility was clearly erroneous, in part because the Court found evidence that the claimed invention had been commercially sold. As the Federal Circuit explained "[i]f a party has made, sold, or used a properly claimed device . . .

proof of that device's utility is thereby established. People rarely, if ever, appropriate useless inventions." *Id.* at 959.

Accordingly, the Examiner's attention is respectfully directed to the 2003 catalog of Exalpha Biologicals, Inc. (available online at www.exalpha.com, catalog number X1588P, last modified: 4/28/03; a printout of which is submitted herewith as Exhibit B). As stated on the antibody data sheet, the immunogen used to generate this antibody was recombinant DAP12 protein. As previously established, DAP12 shares 98% sequence identity with Secreted Protein HHTLF25 and SEQ ID NO:164. Thus, the present situation is similar to *Raytheon v. Roper*, wherein the claimed invention was sold and used, thus demonstrating utility for the claimed invention.

In view of the above arguments, Applicants have provided evidence and reasoning which supports the Applicants' assertion of utility. The utilities asserted in the specification for Secreted Protein HHTLF25 (SEQ ID NO:164) are specific, substantial and credible. Accordingly, Applicants respectfully submit that the rejection of claims 25-70 under 35 U.S.C. § 101 has been obviated. Therefore, Applicants respectfully request that the rejection be reconsidered and withdrawn.

For the reasons discussed above in response to the rejection under 35 U.S.C. § 101, the claimed invention is supported by a specific, substantial and credible asserted utility. The Examiner "should not impose a 35 U.S.C. § 112, first paragraph, rejection grounded on a 'lack of utility' basis unless a 35 U.S.C. §101 rejection is proper." M.P.E.P. § 2107 (IV) at 2100-36. Therefore, because the claimed invention complies with the utility requirement of 35 U.S.C. § 101, the rejections under 35 U.S.C. § 112, first paragraph, based on the alleged lack of utility of the claimed invention, should be withdrawn. Accordingly, Applicants respectfully request that the rejection under 35 U.S.C. § 112, first paragraph, be reconsidered and withdrawn.

Conclusion

Applicants respectfully request the amendments and remarks of the present response be entered and made of record in the present application. In view of the foregoing amendment and remarks, Applicants believe they have fully addressed the Examiner's concerns and that this application is now in condition for allowance. An early notice to that effect is urged. The Examiner is invited to call the undersigned at the phone number

provided below if any further action by Applicant would expedite the allowance of this application.

Applicants believe that there are no fees due in connection with the filing of this paper. However, should a fee be due, please charge the fees to our Deposit Account No. 08-3425. If a fee is required for an extension of time under 37 C.F.R. § 1.136, such an extension is requested and the appropriate fee should also be charged to our Deposit Account.

Respectfully submitted,

Date: October 29, 2003

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